

Claims

1. Device for cleaning of surfaces under water, such as ship hulls etc., comprising a rotary member (1) arranged to be set in rotation by means of separate propulsion means and equipped with nozzles (2) for discharging liquid under pressure against the surface to be cleaned, said nozzles (2) being obliquely attached in relation to the rotational axis (3) of the rotary member (1), so that the water jets being discharged from the nozzles will have a velocity component v_n that is perpendicular to the rotational plane of the rotary member and a velocity component v_p that is parallel with the rotational plane of the rotary member, said nozzles being supplied with liquid under pressure through a hollow spindle (4) concentric with the rotational axis (3), characterized in that the rotary member (1) has shape of a rotary disc (1) through which arbitrary radial sections will have substantially equal shape and size, the parallel velocity component v_p being the sum of a velocity component v_r that is radial in relation to the rotary disc (1) and a velocity component v_t that is tangential in relation to the circular line on the rotary disc along which the nozzles (2) are arranged, the direction of rotation of the rotary disc (1) is chosen such in relation to the inclination of the nozzles (2) that the tangential velocity component v_t for the liquid being discharged from at least half of the nozzles (2) has the same direction as the direction of rotation (R) of the rotary disc (1).
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2. Device as claimed in claim 1, characterized in that at least half of the nozzles (2) have such an inclination that the radial velocity component V_r for water being discharged from these nozzles (2) is positive, i.e. is directed outwards from the imaginary circle line, concentric with the rotary disc (1), that each respective nozzle (2) is localized at.
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3. Device as claimed in claims 1-2, characterized in that the rotary disc (1) is arranged to be set in rotation by means of gear mechanism (5) in engagement with external propulsion means.
4. Device as claimed in claim 3, characterized in that the external propulsion means is a water hydraulic motor.
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5. Device as claimed in any one of the preceding claims, characterized in that the rotary disc is flat or concave on the side facing the surface (8) to be cleaned.
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6. Device as claimed in any one of the preceding claims, characterized in that the rotary disc (1) has a diameter in the range 20-50 cm.
7. Device as claimed in any one of the preceding claims, characterized in that the external propulsion means is arranged to turn the rotary disc at an angular speed of 200 – 700 rpm.
8. Device as claimed in any one of the preceding claims, characterized in that the pressure of the water being supplied to the nozzles (2) is in the range 100 – 500 bars.

9. Device as claimed in claim 8, characterized in that the pressure of the water supplied to the nozzles (2) is in the range 250 – 350 bars.
10. Device as claimed in any one of the preceding claims, characterized in that two or more nozzles (2) are arranged along a common circular line with a centre at the axis (3) of the rotary disc 5 (1), the nozzles being distributed angularly symmetric along said common circle line.
11. Device as claimed in claim 10, characterized in that the rotary disc (1) has at least two such circle lines along which nozzles (2, 2') are arranged with angular symmetry.
12. Device as claimed in any one of the preceding claims, characterized in that it is furnished with spacing elements to ensure that the rotary disc (1) at all times is held parallel with the surface 10 to be cleaned and in a certain, predetermined distance from said surface.
13. Device as claimed in claim 12, characterized in that said spacing elements are wheels.
14. Device as claimed in claim 12 or 13, characterized in that the spacing elements are arranged to hold the rotary disc in a position where the distance between the surface and the nozzles is within the range 0.5 – 2 cm.
15. Device as claimed in any one of the preceding claims, characterized in that the nozzles (2) are arranged to provide conical water jets that hit the surface (8) to be cleaned in areas that in dependence of the inclination of the nozzles (2) are mainly circular or elliptic.
16. Device as claimed in any ones of claims 1-14, characterized in that the nozzles (2) have slit shaped apertures and are arranged to provide water jets that hit the surface (8) to be cleaned in 20 areas that is wider in a direction parallel with the radius of the rotary disc than in a direction perpendicular to same.